

Working Around Aircraft

General Operational Safety Guidelines

During a NASA Airborne Science Mission, participants will be working at the aircraft home base or mission host facility. There are some generally accepted rules, guidelines and pointers for working at an aircraft facility that everyone should remember and follow. These rules and guidelines will apply to all Airborne Science Missions managed by the Earth Science Project Office (ESPO).

Mission General Guidelines and Safety Refresher

If you have never worked on an aircraft, in or around a hangar or on a military base before, these “Dos and Don’ts” may not be familiar to you.....or, they may have slipped your mind!

Following is a list of the most generally applicable ones. The ESPO will modify/add to these as necessary for each individual mission and post them on that mission page. Also, ESPO may hold an Orientation session when you first arrive at the facility. If so, you will receive an Orientation Package that will have pertinent information for working in the host facility. Common sense is your best friend. If you don’t know what is safe....ASK.

AIRCRAFT - WORKING AROUND / ON AN AIRCRAFT

CREW CHIEF/MISSION MANAGER (aircraft point of contact)

These are the “owners” of any aircraft involved in one of our missions. Nothing is done in, on or around an aircraft without notifying one or both of them.....EVER.

ACCESS

There is NEVER any access to an aircraft without the Crew Chief or his deputy’s knowledge and approval. That means that if you arrive at a brilliant solution to your instrument problem or just now remembered that you have to fill that dewar or pull that card and you find there is no Crew Chief around to give you permission to touch the plane, you will have to wait until he or someone he designates is there!

This rule applies to any aircraft, not just “our” mission aircraft. If there are other resident or transient aircraft in the hangar, don’t touch or approach these aircraft without permission from their crew.

If you have an urgent situation and cannot contact the Crew Chief or Mission Manager, talk to someone in the ESPO.

Pay Attention To The:

“Prop Arc”.....DON’T walk through it! Even if there is no power on the plane!

Engine Intake.....DON’T lean on it or hold onto it or lay things down in it!

Ground lines.....DON’T trip over them or pull them loose!

Leading edges, Wing tips, Protruding antennas, Probes, “Remove Before Flight” Flags.....these are all things waiting to put bumps on your head.....or worse!

Skin and structure of the aircraft itself.....if you happen to be pushing a cart or an instrument or a tank of gas or carrying something (a ladder? a pile of boxes?) that can put a dent or a gash in an airplane.....Please ask for assistance!

CREW ACCESS

Pay attention to where the crew are and what they are doing, they also need to have access to the plane!

“FOD” - Foreign Object Damage

This is the term for any object that can cause damage to a plane, a person or anything else by being sucked into an engine, blown by an exhaust or a prop-wash OR by getting lodged somewhere in or on the aircraft. That means not only out on the hangar floor or the aircraft ramp but in the cargo spaces, equipment bays, instrument pods OR in the cockpit!!

So, when you are working around the plane, remove jewelry, hats, glasses, pocket protectors, pens, pencils, tools, I.D badges, change.....in short, anything loose, in or out of your pockets or hanging on you.

It also means if you see something lying on the floor or around the plane, Please pick it up and put it away or dispose of it properly!

TOOLS

When you are working in a NASA hangar during an integration or a mission, there are stringent “Tool Use Policies” in force to protect the aircraft. Any tools that are not instrument specific and are needed for use on an aircraft or in the hangar by the instrument teams, must come from a designated tool chest and must be logged out and in. If a tool is discovered to be missing when an inventory is done, all aircraft in the hangar could be grounded until the tool is located.

Your instrument specific tools also will need to be accounted for and that procedure can be obtained from the Crew Chief or Mission Manager.

When we are at a non-NASA facility, the same care must be taken to track

and account for tools. Please read the section on “FOD” above.

HANGAR - WORKING IN AN AIRCRAFT HANGAR

HANGAR MANAGER

This is the host facility person responsible for everything that goes on in the hangar. The Project Office is the mission liaison to this manager and all interface with him should be done through ESPO.

ACCESS

Access to the hangar for our mission participants is arranged prior to the mission between the ESPO and the Airport or Base Management, it is not necessarily the provision of the Hangar Manager.

Hangar access at any airfield has always been limited but now is much more heavily restricted and controlled. Access is for mission participants only and any exceptions must be arranged through the ESPO.

HANGAR DOORS

Don't touch them or move them without the crew.

FIRE LANES, ACCESS ZONES, CAUTION ZONES

On the floor of a hangar you may see red or yellow painted lines describing areas of caution and aircraft towing and parking lines: “Fire Lanes” and areas in front of power panels and chemical cabinets must be kept free of any obstructions.

Sometimes our mission hangar is shared with resident or other transient aircraft. Aircraft tow and park lines may be used by mission or other aircraft and should be kept clear.

CORDS/LINES

There are almost always power lines, grounding lines, communication lines, possibly air lines lying across the hangar floor. If they will remain for more than a few minutes, they should be covered by a metal, plastic or wood cover to prevent tripping. Please ask for assistance from the crew or ESPO.

SHIPPING / RECEIVING

A Shipping/Receiving area may be set up in the hangar by ESPO to accommodate the daily shipments common during a mission. You will need to check this area every day and remove anything that has arrived for your group so the pile doesn't build up.

A shipping crate storage area may be set aside by ESPO to handle your crates and boxes when they are empty. Do not allow shipping materials to

pile up in the hangar except in designated areas, especially in fire lanes!

VEHICLES

Mission participants are not allowed to drive powered vehicles of any kind inside a hangar without permission from the ESPO.

“FOD”

Again, “FOD” is any object that can be blown, dropped or projected into a person or aircraft (or anything else) to cause damage. Within the confines of an aircraft hangar that usually means something dropped on the floor or left on a surface.

If you see anything that fits that bill, pick it up and find out who it belongs to or where it goes.

GASSES/CRYOGENS/HAZARDOUS SUBSTANCES (WMD????)

Training: All those who use these types of substances should be properly trained.

MSDS Sheets: This info must be available just like in your home lab.

Whether you ship your supplies from home or have them delivered from a local vendor, make sure you have it.

Protection Gear: When you are handling gasses or cryogenics you must have the proper protection gear for doing so. Anyone who handles these items knows what gear is required. Face shields, gloves, etc.....Use it.

Storage must be treated with the same care as at your home lab. ESPO will have arranged hazardous storage.

PERSONAL PROTECTION GEAR

Closed-toe shoes are always required when working in an aircraft hangar.

No sandals or bare feet ever.....even in the tropics! (OSHA?)

There are usually earplugs available to those participants working around the aircraft. If there aren't, get your own and use them. It doesn't take long for engine noise to ruin your hearing.

You should have safety glasses available when your work requires them but it is also a good idea to have them whenever you are around aircraft. Not only is there prop-wash and engine blast from our own aircraft but there are always others moving around the area. In addition, airfields are windy places with lots of dust, dirt and fumes blowing into and through the hangar.

POWER/NETWORK

If there are problems here, contact the ESPO.

EMERGENCY CALLS

Find out how to call for emergency help.....it will probably be in your orientation package.

SMOKING

No smoking is allowed in any aircraft hangar, EVER. There are usually designated areas set up for smoking somewhere outside the hangar away from the aircraft ramp. Don't assume you are in a smoking allowed area.

PHOTOS

Before you take any photos inside or outside an aircraft hangar (digital or otherwise), find out if they are permitted. This is imperative on a military base in this day and age but often required even at commercial facilities. Some facilities will not allow cameras at all. The ESPO will have made an agreement with the host facility regarding cameras and taking pictures.

RAMP/FLIGHTLINE

ACCESS

Access to the ramp, the area outside the hangar doors, and the flight-line is strictly controlled at any airfield, commercial, private or military. The ESPO will have made an agreement with the host field regarding access to the ramp and flight-line. Find out what it is and stick to it.

In general, no one is allowed on the ramp or beyond unless they have the permission of a Crew Chief or ESPO. A special badge may be required.

VEHICLES

Mission participants are not allowed to drive powered vehicles of any kind onto the ramp without permission from the ESPO.

“FOD”

Yep, again! If you see something, pick it up!

PHOTOS

Yep, again! Before you take any photos inside or outside an aircraft hangar (digital or otherwise), find out if they are permitted. This is imperative on a military base in this day and age but often required even at commercial facilities. Some facilities will not allow cameras at all. The ESPO will have made an agreement with the host facility regarding cameras and taking pictures.

SMOKING

Smoking is never allowed on a ramp, in an aircraft, or on the flight-line.

LAB

SPACE

The spaces assigned for “lab space” are almost always SHARED.

The ESPO arranges the space assignments, power, phones, network, tables and chairs. If there are problems, contact ESPO.

EQUIPMENT

Keep Equipment from stacking up in front of exits and entryways.
Always post hazard signs appropriate for associated equipment hazards

HAZARDOUS MATERIALS

Have to be documented, contained and handled just as in your home lab. .
If you have dangerous chemicals or gases make sure you understand the hazards, post signs and let your neighbors know the dangers.

FOOD

Aircraft hangars by their locations and openness are always plagued with birds, bugs and animals. If you have food in the lab and don't keep it in a refrigerator, you and all the others in your space will probably soon have bugs and mice and maybe worse. Often we have the use of refrigerators in the hangar but if not, you might lock it in a cooler. And please clean it up every day.

BASE/FACILITY

ACCESS

If we are working at a military base there will be very strict entry procedures, at the main gate and possibly the hangar. You will be told about these procedures before the mission begins and will probably have to furnish personal information in order to be allowed entry. You may be issued a special badge to allow you access to the base and/or certain buildings.

Even at commercial and private airports, entry procedures are much more stringent than in the past. They must be followed or you will be denied access.

FACILITIES

There may be facilities on the base or airport that we are given permission to use. Please follow any rules for their use that the host sets out for us.

MILITARY HOUSING

If we are using a military base and are allowed military housing, there are very strict regulations that must be followed or you will be asked to leave.